UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 66 TO FACILITY OPERATING LICENSE NO. DPR-57

GEORGIA POWER COMPANY
OGLETHORPE ELECTRIC MEMBERSHIP CORPORATION
MUNICIPAL ELECTRIC ASSOCIATION OF GEORGIA
CITY OF DALTON, GEORGIA

EDWIN I. HATCH NUCLEAR PLANT, UNIT NO. 1

DOCKET NO. 50-321

Introduction

By letter dated May 11, 1979,[1] Georgia Power Company (the licensee) has requested an amendment to the Technical Specifications for Edwin I. Hatch Nuclear Plant, Unit No. 1 (Hatch-1). The amendment would allow the count rate on the Source Range Monitor (SRM) channels to drop below 3 counts per second when the entire core is removed or reloaded.

Discussion

The current Specifications require a minimum count rate of 3 cps for the SRMs during core alterations. The minimum count rate requirement serves two purposes. First, it serves as a continuous functional test of the channel. Second, it assures there are a sufficient number of neutrons in the core so that the SRMs are on-scale and will immediately respond to increases in neutron population. These functions are easily satisfied in cores containing exposed fuel, since spontaneous and photon-induced fission in exposed assemblies supply an adequate number of neutrons to obtain 3 cps on the SRMs.

Maintaining 3 cps is no problem during normal refueling due to the presence of exposed fuel. However, at times when the entire core must be removed from the reactor, the SRM count rate will eventually drop below 3 cps. The current specifications permit two alternatives

for this special case: (1) load neutron sources to maintain the count rate, or (2) substitute movable "dunking" chambers for the stationary SRM detectors. The licensee has noted in his application that both of these alternatives increase the risk of loose objects being dropped into the vessel. We note also that both alternatives increase personnel exposure. Moreover, experience with dunking chambers indicates problems involving both a relatively high failure rate and "pendulum swing" geometric interference. Therefore, we agree that neutron sources and/or dunking chambers are not desirable if other alternatives exist.

Evaluation

Unloading Sequence

The proposed Technical Specification would be operative only during spiral unloading and reloading of the core. In the unloading sequence, fuel cells on the perimeter of the core are unloaded first. Cells are removed sequentially in a spiral sequence with cells closest to the center of the core removed last. Control rods may be momentarily withdrawn in cells which are being worked on, but all defueled cells will contain inserted control rods. Until all the fuel is removed, all fueled and nonfueled cells are required to contain control blades by Technical Specification 3.10.B.

As fuel is removed, count rate will drop in the SRM channels. Since all SRM detectors but one are located some distance from the core center, it is doubtful that the old requirement of at least 3 cps in at least 2 channels could be met. However, because the proposed spiral unloading does not permit imbedded cavities or major peripheral concavities, and because all control blades will be in place, shutdown margin cannot decrease during defueling. Under such circumstances, and since Technical Specification 4.10.C will require functional testing of the SRMs prior to beginning core alterations, we find the proposed change is adequate to satisfy both purposes of minimum count rate and is acceptable during core unloading.

Loading Sequence

The loading sequence differs from the unloading sequence in that two assemblies will first be loaded adjacent to each SRM. This should increase the count rate above 3 cps and thus allow Specification 4.10.C to be met. After this, spiral reloading from the center outward will proceed in the normal manner.

Such a modified spiral loading can lead to imbedded unfueled cells in the intermediate arrays. However, since Specification 3.10.B requires all rods, fueled and unfueled, to have control blades inserted, inadvertent criticality is precluded. In addition, because all cells start out with control blades in place, inadvertent criticality is unlikely even assuming multiple loading and operator errors.

There are five SRM detectors in the Hatch-1 core. One is located near the center, the other four are approximately half a core radius out. There is no monitoring problem unless the central (24-29) SRM detector is inoperable. Assuming this, the first few intermediate arrays at the beginning of the loading sequence will be as much as 3 fuel cells distant from the nearest SRM detector. This leads to considerable attenuation of neutron flux from the central array before it is counted at the detector. However, because this situation is true for only a limited number of intermediate arrays, an inadvertent criticality in these arrays is extremely improbable as discussed above. Therefore, in view of the above and of the additional requirement for functional testing of the SRMs prior to beginning core alteration, we find the proposed technical specification change to be acceptable for spiral loading.

Environmental Considerations

We have determined that this amendment does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that this amendment involves an action which is insignificant from the standpoint of environmental impact, and pursuant to 10 CFR Section 51.5(d)(4) that an environmental impact statement, or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of this amendment.

Conclusion

We have concluded that: (1) because the amendment does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the amendment does not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Dated: June 12, 1979

References

1. Letter, Charles F. Whitmer (Georgia Power Company) to Director of Nuclear Reactor Regulation (NRC), dated May 11, 1979.